

Radioisotope Power Supply, Phase I

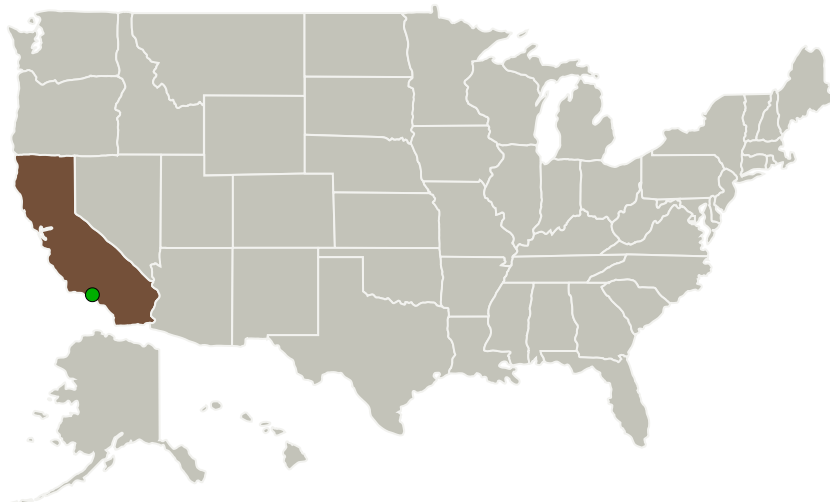
Completed Technology Project (2014 - 2014)



Project Introduction

Between 1998 and 2003, Hi-Z Technology developed and built a 40 mW radioisotope power supply (RPS) that used a 1 watt radioisotope heater unit (RHU) as the energy source. This RPS represented a continuation of 30 years of development that began in the Thermoelectrics Division of General Atomics in the 1960's. This system is the most efficient of its size to this day, and has been validated by extensive life testing. We now propose to devise improvements to the design giving it increased resistance to mechanical shock. In the Phase I we will conduct simulations to inform a trade study examining multiple options of up to 10,000 G of shock tolerance and up to 40 mW of output power. We will also build TEM modules for destructive testing to measure mechanical properties. In Phase II, we will fabricate prototypes that use electric heaters and weights to simulate an RHU. These will be subjected to shock testing at NASA Ames. After iterations of design, build and test, we will present a new RPS design that offers valuable new mission capabilities to the space program.

Primary U.S. Work Locations and Key Partners



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Phase I

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Organizations Performing Work	Role	Type	Location
HI-Z TECHNOLOGY, Inc.	Lead Organization	Industry Women-Owned Small Business (WOSB)	San Diego, California
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations

California

Project Transitions

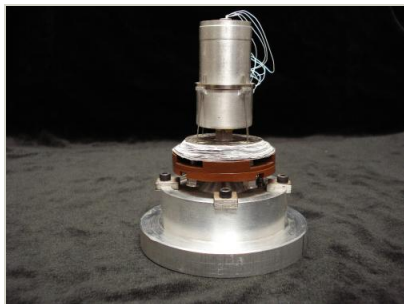
▶ **June 2014:** Project Start

✓ **December 2014:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140592>)

Images



Briefing Chart

Radioisotope Power Supply, Phase I
(<https://techport.nasa.gov/image/130470>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

HI-Z TECHNOLOGY, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

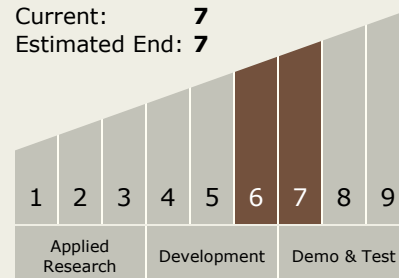
Carlos Torrez

Principal Investigator:

Frederick A Leavitt

Technology Maturity (TRL)

Start: 6
Current: 7
Estimated End: 7



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.1 Power Generation and Energy Conversion
 - └ TX03.1.2 Heat Sources

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System